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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,792	02/05/2004	Phillip C. Cagle	200316243-1	5227

22879 7590 04/20/2006

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/772,792

Applicant(s)

CAGLE, PHILLIP C.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/5/04 &amp; 7/1/05</u> | 6) <input type="checkbox"/> Other: ____  |

**DETAILED ACTION**

**Claim Rejections - 35 USC § 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 9-18, 20-32, and 34-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Cagle et al. (U.S. 2006/0007287).

Cagle et al. disclose ink jet ink comprising aqueous liquid vehicle comprising volatile co-solvent having boiling point below 285 °C, i.e. 10-35% 2-pyrrolidone (humectant), latex, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle where the latex has acid groups on its surface and is formed from 0.5-1% acid monomer and 0.1-3% crosslinking monomer, pigment dispersed in the liquid vehicle wherein the pigment is either polymer encapsulated pigment or pigment having polymer covalently attached to the surface, and fluorosurfactant. There is no requirement that the ink comprise non-volatile solvent. There is disclosed system for printing images comprising the ink, thermal ink jet printer, non-porous substrate, and heating element. There is also disclosed method wherein the ink is ejected onto non-porous substrate from printer followed by heating the printed image. Although there is no

explicit disclosure that the image has good rub resistance, given that Cagle et al. disclose ink and system for printing images identical to that presently claimed, it is clear that the image printed from the ink would inherently possess good rub resistance as presently claimed (paragraphs 2-3, 7, 11, 13-14, 17-18, 21-22, 26-27, 31-32, 38, 41, 49, and 56). Given that it is disclosed that the ink is printed onto heated substrate followed by drying, i.e. solvent is driven off, it is clear that the heating inherently utilizes temperature effective to drive off the solvent which would inherently improve image performance as required in presently claim 39.

In light of the above, it is clear that Cagle et al. anticipate the present claims.

3. Claims 1-5, 8, 11-16, 19, 23-30, 33, and 37-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Shinozuka et al. (U.S. 5,750,592).

Shinozuka et al. disclose ink jet ink comprising aqueous liquid vehicle comprising 0.5-30% volatile co-solvent having boiling point below 285 °C, i.e. ethylene glycol (humectant), colloidal dispersion comprising polymer modified with carboxy groups, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle, pigment dispersed in the liquid vehicle wherein the pigment is polymer grafted pigment, and fluorine or silicone surfactant. There is no requirement that the ink comprise non-volatile solvent. There is disclosed system for printing images comprising the ink, ink jet printer, non-porous substrate, and heater. There is also disclosed method wherein the ink is ejected onto non-porous substrate, i.e. elastic layer of transfer drum, from printer followed by heating the printed image to evaporate the solvent. Although there is no explicit disclosure that the image has good rub resistance, given that Shinozuka et al. disclose ink and system for printing images identical to that presently claimed, it

is clear that the image printed from the ink would inherently possess good rub resistance as presently claimed (col.1, lines 7-9, col.2, lines 60-62, col.3, lines 1-13, col.4, lines 20-35, col.5, line 47, col.6, lines 25-26, col.7, lines 37-45, and col.9, lines 31-48).

In light of the above, it is clear that Shinozuka et al. anticipate the present claims.

4. Claims 1-4, 6-7, 9, 11-15, 17-18, 20, 22-23, 25-29, 31-32, 34, 36-37, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyabayashi '302 (U.S. 6,864,302).

Miyabayashi '302 discloses disclose ink jet ink comprising aqueous liquid vehicle comprising 10-50% volatile co-solvent having boiling point below 285 °C, i.e. glycerol, 2-pyrrolidone (humectant), etc., polymer fine particles in the form of resin emulsion, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle where the resin has acid groups on its surface and is formed from 1-10% acid monomer and 0.2-4% crosslinking monomer, and pigment dispersed in the liquid vehicle wherein the pigment is polymer encapsulated pigment. There is no requirement that the ink comprise non-volatile solvent. There is disclosed system for printing images comprising the ink, ink jet printer, and non-porous substrate. There is also disclosed method wherein the ink is ejected onto non-porous substrate such as coated paper from printer such as thermal printer. Although there is no explicit disclosure that the image has good rub resistance, given that Miyabayashi '302 discloses ink identical to that presently claimed, it is clear that the image printed from the ink would inherently possess good rub resistance as presently claimed (col.1, lines 6-15, col.9, lines 45-47, col.20, line 56- col.21, line 4, col.22, lines 56-63, col.23, lines 52-63, col.25, lines 19-55, col.30, lines 31-40, and Table 11).

In light of the above, it is clear that Miyabayashi '302 anticipates the present claims.

5. Claims 1-4, 6-7, 9, 11-15, 17-18, 20, 23-29, 31-32, 34, and 37-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyabayashi '974 (U.S. 2004/0229974).

Miyabayashi '974 discloses disclose ink jet ink comprising aqueous liquid vehicle comprising 10-50% volatile co-solvent having boiling point below 285 °C, i.e. ethanol, ethylene glycol (humectant), etc., polymer fine particles in the form of resin emulsion, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle where the resin has acid groups on its surface and is formed from 1-10% acid monomer and 0.2-4% crosslinking monomer, and pigment dispersed in the liquid vehicle wherein the pigment is polymer encapsulated pigment. There is no requirement that the ink comprise non-volatile solvent. There is disclosed system for printing images comprising the ink, ink jet printer, non-porous substrate, and heating element. There is also disclosed method wherein the ink is ejected onto non-porous substrate such as coated paper from printer followed by heating the printed image with heating element. Although there is no explicit disclosure that the image has good rub resistance, given that Miyabayashi '974 discloses ink identical to that presently claimed, it is clear that the image printed from the ink would inherently possess good rub resistance as presently claimed (paragraphs 2, 139, 245, 312-316, 318-319, 334-335, 341, 354, 357, 358, 376, and example 25). It is disclosed that the heating element heats the printed image to temperatures greater than 30 °C which would include temperatures that would inherently drive off the solvent as required in present claim 39.

In light of the above, it is clear that Miyabayashi '974 anticipates the present claims.

6. Claims 1-4, 6-7, 9, 11-15, 17-18, 20, 23-29, 31-32, 34, and 37-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Kubota et al. (U.S. 2003/0069329) taken in view of the evidence given in *Hawley's Condensed Chemical Dictionary*.

Kubota et al. disclose ink jet ink comprising aqueous liquid vehicle comprising 0.5-40% volatile co-solvent having boiling point below 285 °C, i.e. ethanol, diethylene glycol (humectant), etc., resin emulsion, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle where the resin has functional groups on its surface including carboxyl groups and is formed from 0.2-4% crosslinking monomer, and pigment dispersed in the liquid vehicle wherein the pigment is polymer encapsulated pigment. There is no requirement that the ink comprise non-volatile solvent. There is disclosed system for printing images comprising the ink, ink jet printer, non-porous substrate, and heating element. There is also disclosed method wherein the ink is ejected onto non-porous substrate such as glass, plastic, or coated paper from printer followed by heating the printed image at 80 °C. Given that it is well known, as evidenced by *Hawley's Condensed Chemical Dictionary* (page 459), that ethanol has boiling point of 78.3 °C, it is clear that when the image is heated at 80 °C, the solvent, i.e. ethanol, will be driven off as required in present claim 39 (paragraphs 24-29, 36, 40, 72, 80-81, 101-102, 112-113, 115 (lines 1-4), 117, 166-167, 178, 228-230, 253, 263-264-550-551, 555-558, and 565). Attention is drawn to Ink 4 in Table F2 which discloses ink comprising polymer encapsulated pigment, resin emulsion wherein the resin is obtained from 3% acid monomer and 0.4% crosslinking monomer, and volatile solvent having boiling point below 285 °C, i.e. glycerin, diethylene glycol, and N-methyl-2-pyrrolidone, and to Table F5 which discloses that such ink has good rub resistance

In light of the above, it is clear that Kubota et al. anticipate the present claims.

7. Claims 1-3, 5, and 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (U.S. 2004/0024083).

Example 5 of Lee discloses ink comprising 16.5% acid functional polymer colloid particulates, i.e. resins known under the tradename Joncryl, 3% carbon black covalently attached to polymer, 0.2% fluorosurfactant, i.e. Zonyl FSO, 7% 2-pyrrolidone (volatile solvent which is humectant), 4% 1,2-hexanediol (volatile solvent), and 1.5% LEG (non-volatile solvent).

In light of the above, it is clear that Lee anticipates the present claims.

**Claim Rejections - 35 USC § 103**

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 5, 16, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyabayashi '302 (U.S. 6,864,302), Miyabayashi '974 (U.S. 2004/0229974), or Kubota et al.



(U.S. 2003/0069329) any of which in view of either Miyamoto et al. (U.S. 2004/0055508) or Uemura et al. (U.S. 6,451,103)

The disclosures with respect to Miyabayashi '302, Miyabayashi '974, and Kubota et al. in paragraphs 4, 5, and 6 above are incorporated here by reference.

The difference between Miyabayashi '302, Miyabayashi '974, or Kubota et al. and the present claimed invention is the requirement in the claims of silicone or fluorine surfactant.

Miyamoto et al., which is drawn to ink jet ink, disclose the use of silicone as anti-foaming agent to prevent bubbles from being generated in the ink and/or allowing generated bubbles to disappear (paragraphs 183-184).

Alternatively, Uemura et al., which is drawn to ink jet ink, disclose the use of fluorine-based or silicone-based surfactant in order to control the surface tension of the ink and the permeability of the ink into substrate (col.9, lines 12-22 and 38-3).

In light of the motivation for using silicone or fluorine-based or silicone-based surfactant disclosed by Miyamoto et al. or Uemura et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use silicone or fluorine-based or silicone-based surfactant in the ink of Miyabayashi '302, Miyabayashi '974, or Kubota et al. in order to produce ink with no foaming or, alternatively, to produce ink with suitable surface tension that effectively permeates into substrate, and thereby arrive at the claimed invention.

10. Claims 22 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyabayashi '974 (U.S. 2004/0229974) or Kubota et al. (U.S. 2003/0069329) either of which in view of Kato et al. (U.S. 6,536,890).

The disclosures with respect to Miyabayashi '974 and Kubota et al. in paragraphs 5 and 6 above are incorporated here by reference.

The difference between Miyabayashi '974 or Kubota et al. and the present claimed invention is the requirement in the claims of the use of thermal ink jet printer.

Miyabayashi '974 and Kubota et al. each disclose the use of ink jet printer, however, there is no specific disclosure in either reference of thermal ink jet printer.

Kato et al., which is drawn to ink jet ink, disclose the use of thermal ink jet printer wherein the ink is ejected on stable basis with no satellite dots produced (col.26, lines 19-25).

In light of the motivation for using thermal ink jet printer disclosed by Kato et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such printer as the printer in Miyabayashi '974 or Kubota et al. in order to stably print ink and produce no satellite dots, and thereby arrive at the claimed invention.

11. Claims 24, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyabayashi '302 (U.S. 6,864,302) in view of Koga et al. (U.S. 6,786,586).

The disclosure with respect to Miyabayashi '302 in paragraph 4 above is incorporated here by reference.

The difference between Miyabayashi '302 and the present claimed invention is the requirement in the claims of heating unit.

Miyabayashi '302 discloses system for printing images comprising ink, ink jet printer, and non-porous substrate, however, there is no disclosure of heating unit to heat the printed image.

Koga et al. disclose the use of heating unit for ink jet printing system in order to heat recording medium to temperature of 50-200 °C in order to accelerate absorption and fixation of the ink (col.16, lines 51-67). Given that the temperatures include those greater than the boiling point of volatile solvents disclosed by Miyabayashi '302, it is clear that the heating would intrinsically result in driving off the solvent as required in present claim 39.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use heating unit in the system of Miyabayashi '302 in order to heat printed image and thus accelerate the absorption and fixation of the ink to the substrate, and thereby arrive at the claimed invention.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1714

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho  
Primary Examiner  
Art Unit 1714

CS  
4/15/06